

LISTING OF CLAIMS

This listing of claims will replace all previous listings.

Listing of Claims:

Claim 1 (Previously Presented): A method for thermal treating granular solids in a fluidized-bed reactor comprising feeding microwave radiation from a microwave source into the fluidized-bed reactor, introducing from below a first gas or gas mixture through at least one gas supply tube into a mixing chamber of the fluidized-bed reactor, the at least one gas supply tube being at least partly surrounded by a stationary annular fluidized bed which is fluidized by supplying fluidizing gas, and supplying the microwave radiation to the mixing chamber through the at least one gas supply tube wherein the at least one gas supply tube is a wave guide.

Claim 2 (Previously Presented): The method as claimed in claim 1, comprising adjusting gas velocities of the first gas or gas mixture and of the fluidizing gas for the annular fluidized bed wherein the gas velocities have a Particle-Froude-Number in the gas supply tube between 1 and 100, in the annular fluidized bed between 0.02 and 2, and in the mixing chamber between 0.3 and 30.

Claim 3 (Previously Presented): The method as claimed in claim 1 wherein the Particle-Froude-Number in the gas supply tube is between 1.15 and 20.

Claim 4 (Previously Presented): The method as claimed in claim 1, wherein the Particle-Froude-Number in the annular fluidized bed is between 0.115 and 1.15.

Claim 5 (Previously Presented): The method as claimed in claim 1, wherein the Particle-Froude-Number in the mixing chamber is between 0.37 and 3.7.

Claim 6 (Previously Presented): The method as claimed in claim 1, comprising adjusting the solids in the reactor have a bed height such that the annular fluidized bed extends beyond the upper orifice end of the gas supply tube and that solids are constantly introduced into the first gas or gas mixture and entrained by the gas stream to the mixing chamber located above the orifice region of the gas supply tube.

Claim 7 (Previously Presented): The method as claimed in claim 1, wherein the microwave radiation is introduced through a gas supply tube constituting a wave guide and/or through a wave guide arranged in the gas supply tube.

Claim 8 (Previously Presented): The method as claimed in claim 1, wherein the microwave radiation is introduced through a plurality of wave guides, each wave guide being provided with a separate microwave source.

Claim 9 (Previously Presented): The method as claimed in claim 7, wherein purge gas is passed through the wave guide.

Claim 10 (Previously Presented): The method as claimed in claim 1, wherein the used frequency for the microwave source lies between 300 MHz and 30 GHz.

Claim 11 (Previously Presented): The method as claimed in the claim 7, wherein the wave guide having an adjustable cross-section and adjustable dimensions are adjusted to the used frequency of the microwave radiation.

Claim 12 (Previously Presented): The method as claimed in claim 1, wherein the stationary annular fluidized bed has a temperature between 150°C and 1500°C.

Claim 13 (Previously Presented): The method as claimed in claim 1, wherein solids discharged from the reactor and separated in a downstream separator are at least partly recirculated to the annular fluidized bed of the reactor.

Claim 14 (Previously Presented): The method as claimed in claim 1, wherein gas introduced through a wave guide is used for an additional fluidization of the stationary fluidized bed.

Claim 15 (Previously Presented): The method as claimed in claim 1, wherein the granular solids are fined-grained solids with a grain size of less than 1 mm and the fined-grained solids are supplied as starting material.

Claim 16 (Withdrawn): A plant for thermal treating granular solids by the method as claimed in claim 1 comprising a reactor, wherein the reactor has a fluidized-bed reactor and a microwave source, and the reactor comprises a gas supply system which is formed such that gas flowing through the gas supply system entrains solids from a stationary annular fluidized bed, which at least partly surrounds the gas supply system, into the mixing chamber, and that microwave radiation can be introduced by the gas supply system.

Claim 17 (Withdrawn): The plant as claimed in claim 16, wherein the gas supply system includes a gas supply tube extending upwards substantially vertically from the lower region of the reactor into the mixing chamber of the reactor, the gas supply tube being surrounded by a chamber which at least partly extends around the gas supply tube and in which the stationary annular fluidized bed is formed.

Claim 18 (Withdrawn): The plant as claimed in claim 17, wherein the gas supply tube is arranged approximately centrally with reference to the cross-sectional area of the reactor.

Claim 19 (Withdrawn): The plant as claimed in claim 16, wherein the gas supply tube constitutes a wave guide for introducing the microwave radiation.

Claim 20 (Withdrawn): The plant as claimed in claim 16, wherein in the gas supply tube at least one wave guide is arranged for introducing the microwave radiation.

Claim 21 (Withdrawn): The plant as claimed in claim 16, wherein a plurality of gas supply tubes and/or a plurality of wave guides are provided, a separate microwave source being connected to each wave guide.

Claim 22 (Withdrawn): The plant as claimed in claim 19, wherein the wave guide has a rectangular or round cross-section.

Claim 23 (Withdrawn): The plant as claimed in claim 19, wherein the wave guide has a length of 0.1 m to 10 m.

Claim 24 (Previously Presented): The method as claimed in claim 10, wherein the used frequency is between 400 MHz and 3 GHz.

Claim 25 (Previously Presented): The method as claimed in claim 10, wherein the used frequency is at an Industrial, Scientific, and Medical (ISM) frequency of 435 MHz, 915 MHz, or 2.45 GHz.